

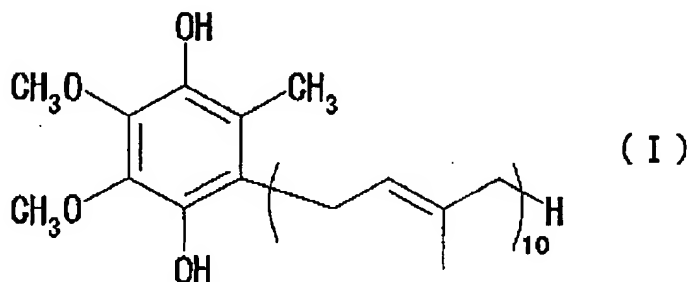
Application Serial No. 10/500,249
Client/Matter No. 5404/79

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IN THE CLAIMS:

Amend Claims 1 and 29. Cancel Claims 33, 35, 36, 44, 46, 54 and 56. The changes in these Claims are shown with ~~strike-throughs~~ for deleted matter and underlines for added matter. A complete listing of the pending claims is set out below with proper claim identifiers.

1. (Currently Amended) A process for producing the reduced coenzyme Q₁₀ represented by the following formula (I):



which comprises culturing reduced coenzyme Q₁₀-producing microorganisms in a culture medium containing a carbon source, a nitrogen source, a phosphorus source and a micronutrient to obtain microbial cells containing reduced coenzyme Q₁₀ at a ratio of not less than 70 mole % among the entire coenzymes Q₁₀.

optionally disrupting the microbial cells under the condition that the reduced coenzyme ~~coenzymes~~-Q₁₀ is protected from an oxidation reaction, and

extracting thus-produced reduced coenzyme Q₁₀ by an organic solvent under the condition that the reduced coenzyme Q₁₀ is protected from an oxidation reaction, to thereby obtain an extract containing not less than 70 mole % reduced coenzyme Q₁₀ among the entire coenzymes Q₁₀.

- 2-3. (Canceled)
4. (Previously Presented) The process according to Claim 1, wherein the culture is carried out at 15 to 45°C and at a pH of 4 to 9.

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5. (Previously Presented) The process according to Claim 1,
wherein the concentration of the carbon source in the culture is controlled to a concentration that no adverse effects are substantially caused on the productivity of reduced coenzyme Q₁₀.

6-15. (Canceled)

16. (Previously Presented) The process according to Claim 1,
wherein the extraction of reduced coenzymes Q₁₀ is carried out from wet cells or dry cells of the microbial cells or disrupted product thereof by using a hydrophilic organic solvent.

17. (Canceled)

18. (Previously Presented) The process according to Claim 1,
wherein the extraction of the reduced coenzymes Q₁₀ is carried out from an aqueous suspension of the microbial cells or disrupted product thereof by using a hydrophobic organic solvent.

19. (Original) The process according to Claim 18,
wherein the hydrophobic organic solvent is a hydrocarbon, a fatty acid ester or an ether.

20. (Previously Presented) The process according to Claim 18,
wherein the hydrophilic organic solvent is used as an auxiliary solvent in combination with the hydrophobic organic solvent.

21. (Original) The process according to Claim 20,
wherein the hydrophobic organic solvent is a hydrocarbon, and the hydrophilic organic solvent is an alcohol.

22-23. (Canceled)

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24. (Previously Presented) The process according to Claim 20,
wherein the extraction is carried out under the condition that the hydrophobic organic solvent is contained in 25 to 65% by volume and the hydrophilic organic solvent is contained in 5 to 50% by volume.

25-28. (Canceled)

29. (Currently Amended) The process according to Claim 1,
wherein the reduced coenzyme Q₁₀ is contained at a ratio of not less than 70 mole % among the entire coenzymes Q₁₀
in the case that the reduced coenzyme Q₁₀-producing microorganisms are cultured with shaking at an amplitude: 2 cm, 310 reciprocation/min at 25°C for 72 hours in 10 mL of a culture medium including glucose: 20 g, peptone: 5 g, yeast extract: 3 g, malt extract: 3 g per L at a pH of 6.0)/L, pH: 6.0 using a test tube with an inner diameter: 21 mm, and an entire length: 200 mm,
the obtained broth is optionally concentrated,
the obtained solution is vigorously shaken for 3 minutes using 10 parts by volume of glass beads (425 to 600 μm), to disrupt the microorganisms under a nitrogen atmosphere in the concomitant presence of 3 parts by volume of isopropanol and 18.5 parts by volume of n-hexane relative to 10 parts by volume of the broth, and
the prepared hydrophobic organic solvent phase, n-hexane phase[[,]] is analyzed by HPLC.

30. (Original) The process according to Claim 29,
wherein the reduced coenzyme Q₁₀-producing microorganisms have not less than 1 μg/mL of a productivity of reduced coenzyme Q₁₀ per unit culture medium when measured by HPLC under the condition according to Claim 29.

31. (Previously Presented) The process according to Claim 30,
wherein the microorganisms are microorganisms of the genus *Agrobacterium*, the genus *Aspergillus*, the genus *Acetobacter*, the genus *Aminobacter*, the genus *Agromonas*, the genus *Acidiphilium*, the genus *Bulleromyces*, the genus *Bullera*, the genus

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Brevundimonas, the genus *Cryptococcus*, the genus *Chionosphaera*, the genus *Candida*, the genus *Cerinosterus*, the genus *Exisophiala*, the genus *Exobasidium*, the genus *Fellomyces*, the genus *Filobasidiella*, the genus *Filobasidium*, the genus *Geotrichum*, the genus *Graphiola*, the genus *Gluconobacter*, the genus *Kockovaella*, the genus *Kurtzmanomyces*, the genus *Lalaria*, the genus *Leucosporidium*, the genus *Legionella*, the genus *Methylobacterium*, the genus *Mycoplana*, the genus *Oosporidium*, the genus *Pseudomonas*, the genus *Pseudozyma*, the genus *Paracoccus*, the genus *Petromyces*, the genus *Rhodotorula*, the genus *Rhodospiridium*, the genus *Rhizomonas*, the genus *Rhodobium*, the genus *Rhodoplanes*, the genus *Rhodopseudomonas*, the genus *Rhodobacter*, the genus *Sporobolomyces*, the genus *Sporidiobolus*, the genus *Saitoella*, the genus *Schizosaccharomyces*, the genus *Sphingomonas*, the genus *Sporotrichum*, the genus *Sympodiomyopsis*, the genus *Sterigmatosporidium*, the genus *Tapharina*, the genus *Tremella*, the genus *Trichosporon*, the genus *Tilletiaria*, the genus *Tilletia*, the genus *Tolyposporium*, the genus *Tilletiopsis*, the genus *Ustilago*, the genus *Udeniomyces*, the genus *Xanthophilomyces*, the genus *Xanthobacter*, the genus *Paecilomyces*, the genus *Acremonium*, the genus *Hyhomonus*, or the genus *Rhizobium*.

32-57. (Canceled)

58. (New) The process according to Claim 1,
wherein the production amount of reduced coenzyme Q₁₀ on completion of the culture is not less than 1 µg/mL.

59. (Previously Presented) The process according to Claim 5,
wherein the culture is carried out by a fed batch culture method.

60. (Previously Presented) The process according to Claim 59,
wherein the carbon source is supplied to the culture medium separately from other components.

61-64. (Canceled)

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65. (Previously Presented) The process according to Claim 62, wherein the cell disruption is carried out by a physical treatment.
66. (Previously Presented) The process according to Claim 65, wherein the physical treatment is carried out by a high pressure homogenizer, an ultrasonic homogenizer, a French press or a ball mill.
67. (Previously Presented) The process according to any one of Claim 62, wherein the cell disruption is carried out under an acidic to a weakly basic condition.
68. (Previously Presented) The process according to any one of Claim 62, wherein, as the organic solvent to be used for extraction of reduced coenzyme Q₁₀, at least one species of hydrocarbons, fatty acid esters, ethers and nitriles is used.
69. (Previously Presented) The process according to Claim 16, wherein the hydrophilic organic solvent is acetone, acetonitrile, methanol, ethanol, 1-propanol or 2-propanol.
70. (Previously Presented) The process according to Claim 20, wherein the hydrophobic organic solvent is an aliphatic hydrocarbon, and the hydrophilic organic solvent is a monohydric alcohol containing 1 to 5 carbon atoms.
71. (Previously Presented) The process according to Claim 20, wherein the hydrophobic organic solvent is at least one species of hexane and heptane, and the hydrophilic organic solvent is at least one species of methanol, ethanol, 1-propanol and 2-propanol.
72. (Previously Presented) The process according to Claim 18, wherein the extraction is carried out by continuous extraction.

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73. (Previously Presented) The process according to Claim 1,
wherein the extraction is carried out under an acidic to a weakly basic
condition.
74. (Canceled)
75. (Previously Presented) The process according to Claim 74,
wherein the condition that the reduced coenzyme Q₁₀ is protected from an
oxidation reaction is a deoxygenized atmosphere, a high salt concentration condition, the
condition in the presence of a strong acid, the condition in the presence of an antioxidant, or
a reduction condition.
76. (Previously Presented) The process according to Claim 1,
wherein the obtained reduced coenzyme Q₁₀ is purified optionally and
crystallized to obtain a reduced coenzyme Q₁₀ crystal.